

### **3.0 PROJECT OBJECTIVES AND REMOVAL ACTIVITIES**

#### **3.1 PROJECT OBJECTIVES AND APPROACH**

The purpose of the work was to remove the underwater debris from the Columbia River adjacent to Bradford Island, and to collect water quality samples during the removal action. The water quality samples were collected to identify the impact of the debris removal on river water quality and provide data which may be used as part of future site evaluations.

The primary objectives of the equipment removal were:

- Remove the electrical items present in the Columbia River located proximate to the landfill.
- Collect and analyze water column samples from the area surrounding the underwater debris and an background location.
- Conduct turbidity monitoring during the removal action from the area surrounding the underwater debris and from one upgradient location.

#### **3.2 VARIANCES FROM ORIGINAL SCOPE**

Following an unsuccessful attempt to install the turbidity screen in accordance with the Work Plan, an alternate turbidity method was proposed and accepted by the Agencies. Appendix A contains the proposal from the USACE to the Agencies. In general, the variance consisted of continuous down current monitoring for turbidity. Additionally, the identified upgradient location for water column and turbidity monitoring (Picture Rock) was insufficient since the river flow direction changes in the vicinity of the island due to operation of the dam. The river flows east in the vicinity of the work area; therefore the upcurrent turbidity measurement was collected on the most upcurrent location on the barges.

#### **3.3 DEBRIS REMOVAL ACTIVITIY**

The proposed plan was to remove all electrical equipment (debris) and transport these wastes to an appropriate disposal facility. Additionally, if non-electrical debris was observed that may contain hazardous materials, such as a grease bucket, these items will be removed. The other non-electrical debris, (i.e. wire and concrete), was not planned to be removed to minimize disturbance to potentially impacted sediments. However, it was evident that in order to evaluate if additional debris was located beneath the large coils of wire rope discovered in Piles #1 and #2, they would need to be removed. Therefore all wire rope observed in the river as well as along the shoreline was removed. The removal was staged from barges and work boats mobilized to the work areas. The higher than expected water velocity prevented the deployment of the engineering controls. Turbidity monitoring was conducted during all removal activities.

### 3.3.1 Removal Activities

A spud barge mounted with a crane and a flat deck material barge was positioned outside the work areas at each of the three specified piles to serve as working and debris recovery platforms. A tug and one or two work boats also assisted with the removal operations, monitoring and sampling. Upon starting at a pile, the divers first set an underwater line that established the edge of the pile. This line was based on the planned locations of the turbidity screens, therefore it was larger than the previously delineated limits of the piles. The divers then searched for and recovered debris starting from one end of the debris pile using a line search method. The line search method consisted of searching along a 50 to 75 foot long line anchored to the edges of the underwater line. If the area to be searched was larger than could be covered in one pass along the search line, the area was divided into manageable sections. For instance, Pile #1 was divided into a north and south half and Pile #2 was divided into west, middle and east thirds (see Figure 3-1). The divers swam the length a line and searched for electrical equipment, stopping to recover debris when it was found. Once all electrical equipment was recovered along the search transect, the line was advanced in 5-foot increments along the debris field until the area was completely searched. A video camera mounted on the diver's helmet recorded underwater activities.

When a piece of debris was encountered, the diver assessed whether the piece could be manually placed into a metal box by hand or whether it would need to be directly removed using the crane.

Before hoisting items or placing them in the metal work box, the type of item was identified and assessed whether the item could contain liquids (e.g., inerteen capacitor), or contained solid PCBs (e.g. lighting ballasts) and was damaged. When this occurred, the sediments adjacent to and beneath the item was removed using a small hydraulic pump fitted with a hose directed by the diver. The following procedure was used at these locations:

- One diver removed the sediments adjacent to the item and the effluent was placed into a 55-gallon drum.
- The second diver began lifting and placing the item into a reinforced 8-mil plastic bag, at which time the first diver was attempting to capture the suspended sediment with the pump.
- Once the item was removed and placed into the metal box, the first diver removed the sediment that was immediately beneath the item.

Once at the surface, each item was placed into plastic-lined storage bins in a containment area on the materials barge, or PCB containing equipment was placed into 55-gallon drums. The containment area was lined with oil absorbent mats and socks to minimize the potential for leakage into the river.

### **3.3.2 Monitoring and Sampling Activities**

The monitoring and sampling and analysis program during the removal action included the water-column sampling and turbidity monitoring.

#### **3.3.2.1 Water-Column Sampling**

Sampling was conducted during removal actions in all three pile locations to measure the concentration of PCBs and suspended sediment in the water column during debris removal. At Pile #1 one water column sample was collected before removal activities were initiated to measure the steady state concentration of PCBs in the water column in this location (sample number 04WC). The timing for the other samples collected coincided with elevated turbidity measurements in each work area. The sample of the water and associated suspended sediment was collected using a peristaltic pump. The pump was stationed on the work barge and operated by URS. A ½ inch diameter PVC tubing, which was connected to the pump, was given to the diver to take to the sampling area. One diver held the intake end of the tubing and the turbidity probe, while a second diver conducted the search and recovery efforts. The sample intake hose was between 10-30 feet from the removal effort at all times during the sampling.

#### **3.3.2.2 Turbidity Monitoring**

To ensure compliance with the prescribed standard of 5 NTU above background, and the revised monitoring schedule, continuous monitoring (10 – 15 minute intervals) was conducted down current of the divers during all removal activities. Up current measurements were obtained on a hourly basis. A turbidity profile was measured at approximately 20%, 60%, and 80% of river depth at both monitoring stations.